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Our Planet Reviewed in Corsica 2019-2021: a large-scale survey of neglected biodiversity on a Mediterranean island

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Abstract. – From 2019 to 2021, scientific field campaigns have been organised in Corsica by the Muséum national d'Histoire naturelle, the Office français de la biodiversité and the Collectivité de Corse as part of the "Our Planet Reviewed" naturalist exploration programme. This paper presents the context, the state of biogeographical and taxonomic knowledge prior to our expeditions, and the objectives, the methods and the first results obtained. The aim was to establish a modern survey of the species present in a selection of sites representative of different Corsican ecosystems, and to further develop the natural history collections through depositing new specimens and species with associated standard DNA barcodes, useful for their identification. Over a period of three years, nineteen sites were surveyed with a semi-standardised protocol and a large-scale trapping scheme was organised in three of these. Sampling efforts focused on forest habitats at higher altitudes and on coastal dune and lowland marshland habitats. A vast array of methods was used to collect invertebrates, with a specific effort on flight-interception traps and pan traps. A total of 34 experts participated to the field surveys and more than 80 further contributed to the study of the specimens. Occurrence data are available in the Inventaire national du patrimoine naturel (http://www.inpn.fr) and, for specimens processed through DNA barcoding, specimen and DNA sequencing data will be accessible in the Barcode of Life datasystems (BOLD : http://www.boldsystems.org). In early 2023, the assembled datasets included 31,100 occurrence data for 3,900 taxa of terrestrial arthropods, representing a 53% increase in publicly available data for the island. More than 6,800 DNA barcode sequences have been produced for arthropods, representing a 14-fold increase in available sequences of Corsican insects compared to those available before the start of the programme. So far, these efforts resulted in producing the first Corsican records for 148 species and in the description of 12 species new to science.

Résumé. – ***La Planète Revisitée en Corse 2019-2021* : un grand inventaire de la biodiversité négligée dans une île méditerranéenne**. De 2019 à 2021, des missions scientifiques de terrain ont été organisées en Corse par le Muséum national d'Histoire naturelle, l'Office français de la biodiversité et la Collectivité de Corse dans le cadre du programme d'exploration naturaliste "La Planète Revisitée". Cet article présente le contexte, l'état des connaissances biogéographiques et taxinomiques avant le début du programme, les objectifs, les méthodes ainsi que les premiers résultats obtenus. L'objectif était d'établir un inventaire moderne des espèces présentes

dans une série de sites représentatifs de différents écosystèmes et d'enrichir les collections d'histoire naturelle de nouveaux spécimens et nouvelles espèces, et en y associant des codes-barres ADN standards, utiles à leur identification. Pendant les trois ans, 19 sites ont été inventoriés de façon semi-standardisée dont trois ont bénéficié d'un dispositif de piégeage d'ampleur. L'accent a été mis sur l'échantillonnage des espèces forestières, ainsi que sur les pièges à interception et les assiettes colorées pour les diptères et les hyménoptères. Au total, 34 experts ont participé aux inventaires de terrain et plus de 80 ont contribué à l'étude du matériel. Les données d'observation sont mises à disposition dans l'Inventaire national du patrimoine naturel (http://www.inpn.fr), et pour les individus associés à des codes-barres ADN, les données des spécimens et les séquences ADN seront accessibles dans le Barcode of Life datasystems (BOLD : http://www.boldsystems.org). Début 2023, les jeux de données produits comprennent 31 100 données d'occurrence pour 3900 taxons d'arthropodes terrestres, ce qui représente une augmentation de 53 % des données publiques disponibles pour l'île. Les codes-barres ADN de plus de 6800 spécimens d'arthropodes ont été produits, ce qui représente 14 fois plus de séquences existantes pour les insectes de Corse que ce qui était disponible avant le début du programme. Jusqu'à présent, 148 signalements nouveaux et 12 espèces nouvelles pour la Science ont été publiés.

Keywords. – Arthropoda, Arachnida, Insecta, Crustacea Isopoda, expedition, sampling technique, survey protocol, survey strategy, map, sample processing, barcoding, integrative taxonomy.

Over the past 30 years, scientists have become more fully aware of the immensity of biodiversity. There are probably between 5 and 10 million eukaryotic species awaiting to be discovered today (i.e., Mora *et al.*, 2011). It has been estimated that a quarter or even half of these species could disappear by the middle or the end of the present century (Régnier *et al*., 2015; Cowie *et al*., 2022). The stakes of gathering knowledge to protect this biodiversity before it is too late are therefore high and require, more than ever before, a new pace of exploration and disclosure of biodiversity (Bouchet *et al.*, 2009).

In 2006, the Muséum national d'Histoire naturelle (MNHN, Paris, France) and Pro-Natura International NGO (France) launched "Our Planet Reviewed", a major nature exploration programme that aims at acquiring new knowledge on the world's most biodiverse but hitherto most poorly explored regions for the main groups of organisms involved in the programme: marine and terrestrial invertebrates. This "neglected" biodiversity (mainly invertebrates, together with fungi) represents 95% of the extant biota on this planet and plays a fundamental role in the functioning and equilibrium of ecosystems (Bouchet *et al*., 2009; Mora *et al*., 2011).

"Our Planet Reviewed" expeditions typically spend a couple of weeks to months at one single location with numerous researchers involved (usually more than 20 for fieldwork). This "bioblitz" approach allows for the mobilisation of major logistical and human resources (expertise) on a wide diversity of species groups (Touroult *et al.*, 2018). The added outreach dimension of these operations, including the educational component supported by research activities and the wide media coverage, makes the "Our Planet Reviewed" programme one of a kind (Mauz, 2011). The number and diversity of participants ensure extensive research output and the gathered data feed large international databases (Touroult *et al*., 2021).

After focusing on tropical biodiversity since 2006, from 2019 to 2021 "Our Planet Reviewed" operated in Corsica, the first time in a temperate region. Sitting within the Mediterranean Basin hotspot as defined by Myers *et al*. (2000) and as part of the Tyrrhenian Islands chain, Corsica is considered one of the ten Mediterranean biodiversity hotspots (Médail & Quezel, 1999). It is a mountainous island with an outstanding diversity of habitats and a high afforestation rate compared to other Mediterranean islands (Delage & Hugot, 2020; Quézel & Médail, 2003). Although considered a relatively well-known region from a faunistic point of view, the institutional collections of invertebrate specimens originating from this island are rather scarce and outdated. Moreover, these specimens are not usually

associated with genetic data useful to better understand and define species boundaries, and there is, for instance, a gap in coverage of DNA barcode reference libraries for Mediterranean species, especially endemic ones.

The Corsica survey is born out of a unique cooperation between the three main partners: the MNHN, the Collectivité de Corse (CDC) and the Office français de la biodiversité (OFB). Its key objectives can be summarised in three points.

1) To establish a comprehensive survey in a representative number of localities chosen for the variety of their habitats, in particular sites where biodiversity conservation is at stake. This contributes to produce a naturalist reference base of knowledge for management, conservation and research purposes.

2) To develop the reference natural history collections for this biogeographical region, and to enhance their impact through the association of DNA barcode sequences and the release of precise collecting data as well as images of the specimens preserved in the collections. Indeed, DNA barcode sequences of species of the Mediterranean area - and *a fortiori* from an island like Corsica - are scarce if compared to existing data from continental Europe (Geiger *et al*., 2016; Karlsson *et al*., 2020).

3) To deploy an intensive sampling effort in a few sites to obtain new methodological insights for optimising conventional inventory schemes (Ichter *et al*., 2018).

The discovery of new species for science or for Corsica was not part of the main objectives, considering that the island had already been intensively studied by naturalists. Nevertheless, it was considered a likely outcome in taxonomic groups that had received little attention in the past e.g., some Diptera families.

For Corsica, such a programme represents a unique opportunity to place its biodiversity central to investigations benefiting from a broad international expertise and to gain both national and international visibility. It is also an opportunity to raise local awareness of the uniqueness, extent and importance of biodiversity as the biological heritage of the inhabitants of the island. As such, several nature excursions were organised by our experts for local schools and the general public. Together with the local demand for a better knowledge of Corsican biodiversity, advancing the inventory of French natural heritage was one of the main reasons to choose Corsica as a location. The MNHN and OFB are managing the National Inventory of Natural Heritage (http://www.inpn.fr), a reference portal on taxonomy, distribution and conservation status of French species, habitats and ecosystems.

With this paper, we introduce a thematic issue of the *Bulletin de la Société entomologique de France* dedicated to the outcomes of the "Our Planet Reviewed" expeditions in Corsica for terrestrial arthropods. Other taxa such as lichens, fungi and earthworms were also the target of the programme (as were marine organisms) but those results are not reported here (see e.g. Marchán *et al.*, 2022).

Here, we present a summary of the state of biogeographic and taxonomic knowledge on the arthropods of Corsica before the start of the survey, the study area, the scientific and technical partnerships, the implemented collecting techniques and protocols, as well as some preliminary results.

State of knowledge on the terrestrial arthropods of Corsica before the *Our Planet Reviewed* survey

As one of the northernmost Mediterranean islands and closest to continental Europe, Corsica has long been a popular destination for naturalists and the so-called "Island of Beauty" has been the subject of numerous surveys since the 18th century. Entomologists who published the results of their explorations of Corsica hail mostly from the continent including Italy,

France, Germany, Great Britain, Belgium and the Netherlands. Unfortunately, almost none of these works relates solely to Corsica and there remains no synthesis specifically addressing the arthropod or insect fauna of the island. Overall, only the Lepidoptera (Rungs, 1988) and Coleoptera orders were comprehensively studied in synthetic works and catalogues on the fauna of Corsica. Although this does not imply that knowledge on other orders is completely lacking, it is unfortunate that information regarding most other orders is scattered amongst many publications of taxonomic descriptions, faunistic notes, field trip reports and grey literature reports.

The Corsican territory has been the subject of successive waves of explorations aiming to gain knowledge of its entomofauna. The efforts from the 18th and 19th centuries often differ greatly in reporting from more recent ones as, all too often, the mere presence of a species on the island is reported with no further details about localities of occurrence. From the end of the 19th century onwards, research seems to be more concentrated on presumed areas of endemism, i.e. in the mountains and in a few coastal areas, in particular the surroundings of the main towns and the Bonifacio region (*cf*. map fig. 2B). The inter-war period and the 1950s and 1960s saw a series of new field excursions contributing to the enrichment of the entomology collections at the MNHN (Hymenoptera, Orthoptera, etc.). Since the 1970s, exploratory activity largely slowed down, with notes and articles becoming rarer. It could be said that this period reflected the general understanding that the insect fauna of Corsica was well-known. This assumption is consistent with the locations of surveys carried out in the 1980s and 1990s that mostly focused on difficult-to-access protected areas, and, in particular, the small satellite islands of Corsica (Lavezzi, Cerbicale, etc.). Benedetto Lanza and his collaborators led these micro-island studies in the 1980s and 1990s, paving the way for the Small Mediterranean Islands Initiative (PIM) in the 2010s. More recently, a new dynamic around Corsican insects has been launched under the impetus of the Corsican Environmental Agency with the creation of the Corsican Invertebrate Conservation Observatory (OCIC). This observatory enables and fosters the initiation of new surveys to mobilise biogeographical and ecological knowledge on several orders of insects. At present, dragonflies (Odonata), butterflies (Lepidoptera, Rhopalocera), ants (Hymenoptera, Formicidae), grasshoppers and crickets (Orthoptera) are among the best-known taxa of the island.

Below is an overview of the state of faunistic knowledge for a selection of orders prior to, and targeted by, the Our Planet Reviewed survey.

Coleoptera. – The Coleoptera fauna of Corsica has been relatively well studied, although for a long time in a limited number of locations and often only during the summer period. The founding work is the "catalogue raisonné" of Sainte-Claire-Deville (1914) and the supplements published by this author (Orousset, 2021). Many French entomologists published faunistic notes on new species from the island and in recent years the society Magellanes began a series of remarkably well illustrated collective works (e.g. Jiroux *et al*., 2019, on Carabidae). In terms of inventories, since 2010 the Office national des Forêts (ONF) has carried out a sampling campaign of saproxylic beetles by interception trapping (Polytrap™) in several forest areas. Only a limited number of DNA barcodes were available before the start of the programme, some generated by the PASSIFOR project for saproxylic Coleoptera (Rougerie *et al*., 2015).

Heteroptera. – Heteropterans have been the subject of occasional and sporadic studies since the end of the 19th century, particularly for the description of endemic Corsican taxa. The first authors to publish faunistic notes were Signoret (1862), Meyer-Dür (1869), Marshall (1872), Saunders (1894) and Mac Gillavry (1912). In the mid-20th century, the

description of several taxa continued and faunistic knowledge advanced, owing in part to the work of Cesare Mancini, Poisson (1954), Bigot (1959), Ramade (1964) and Péricart (1965). More recently, Dusoulier (2018) compiled an unpublished synthesis reporting a diversity of approximately 600 species in Corsica. Despite these efforts and, when considering numerous recent discoveries, there remains much faunistic and taxonomic work to be done in Corsica.

Diptera. – According to the taxonomic experts involved in this survey, the level of knowledge on different families of Diptera prior to the Our Planet Reviewed Corsica expedition varied greatly. Most families seem rather well known (Bombyliidae, Dolichopodidae, aquatic Empididae, Limoniidae, Pediciidae, Rhagionidae, Tipulidae), while others appear poorly explored (Bibionidae, Carnidae, Ephydridae, Pipunculidae, Stratiomyidae) or have an unclear status (terrestrial Empididae and Hybotidae). Only Conopidae and Syrphidae, two flower-visiting families, are considered well-known. Over forty papers with data on Corsican Diptera could be assembled but only three stand out by their comprehensive nature and coverage of multiple families (Becker *et al*., 1910; Kuntze, 1913; Edwards, 1928). Each of them dates back to the early 20th century.

Hymenoptera. – Knowledge of the Hymenoptera is variable according to the taxonomic groups but overall, very incomplete, particularly regarding taxonomy. Among the Aculeate Hymenoptera, the Pompilidae, the Chrysididae, the Scoliidae as well as some Apidae genera (e.g. *Bombus* Latreille, 1802 and *Ceratina* Latreille, 1802) were the object of important historical surveys in the late 19th and early 20th centuries, notably by Charles Ferton. An inventory of the wasps and bees of Corsica initiated in 2017 by Romain Le Divelec and Claire Villemant produced a large number of specimens sampled, particularly in southern Corsica. Parasitoid Hymenoptera are largely unknown. In contrast, ants (Formicidae) are well known since the OEC's Atlas of ants of Corsica (Blatrix *et al*., 2018) and a recent molecular study (Blatrix *et al*., 2020).

Araneae. – The spiders of Corsica have been relatively well known for a long time, thanks to the visit by Eugène Simon to the island in 1869. Much more recently a series of study campaigns have been carried out at the request of the Parc Naturel Régional de Corse (1987, 1988 and 1993: Biodiversity team of Rennes 1 University) (Canard, 1989) and of the DREAL of Corsica (2010 to 2018: Land management and Biodiversity team of Rennes 1 with the French Association of Arachnology). In addition to the works by French authors specifically devoted to the arachnological fauna of Corsica, there are also around fifteen publications of the same type by foreign, mainly British and German, arachnologists.

Isopoda. – For the Crustacea Isopoda, Corsica was the object of six dedicated expeditions supported by the National Research Council of Florence (Italy) during the 1980s, leading to the description of 8 new taxa and the discovery of 12 species for the first time on the island (Taiti & Ferrara, 1996). With 76 species recorded, Corsica is one of the richest regions of France for terrestrial isopods and comprises about 25% of endemic taxa. Recent research on the island (LISC & Troglorites, 2020) revealed that several taxa still await description.

We also attempted to estimate knowledge through datamining of existing information systems on biodiversity (table I). We thus synthesised the data available before the Our Planet Reviewed survey as the number of species recorded per 10 × 10 km grid cell, as an indicator of the intensity of survey and data sharing. These data originate from the portal of the National Inventory of Natural Heritage - INPN (MNHN & OFB, 2022), which includes all available public observations, collections or literature data, precise or at least assignable to a municipality, for the period from 1.I.1900 to 31.XII.2018. This French reference portal also includes the

Table I. – Status of available data for selected major taxonomic groups in public databases prior to the Our Planet Reviewed surveys (sources INPN-OpenObs and BOLD (www.boldsystems.org), period considered: 1900-2018, analyses conducted in November 2022). Occurrence data density expressed as the number of public observation data divided by the area of the territory considered.

Taxon	Number of occurrence data in Corsica	Occurrence data density in Corsica (per km²)	Occurrence data density in continental France (per km²)	Number of species with at least one data record in Corsica	Number of sequenced specimens from Corsica publicly available in BOLD
Arachnida	7134	0.8	0.8	654	95
Insecta, Coleoptera	11226	1.3	2.5	1276	75
Insecta, Diptera	1675	0.2	0.4	179	18
Insecta, Hemiptera	1567	0.2	0.3	345	39
Insecta, Hymenoptera	6951	0.8	0.4	517	117
Insecta, Lepidoptera	14472	1.7	6.8	989	317
Insecta (all orders combined)	51164	5.9	14.5	3777	569
Malacostraca, Isopoda, Oniscidea	1324	0.2	0.1	77	0

data shared at the international level in the framework of GBIF (https://www.gbif.org/). The result (fig. 1-2) shows an irregular coverage of the Corsican territory, with some similarities between the different taxa but also different geographical gaps. Overall, sampling seems most dense around the main cities (Bastia, Bonifacio, Corte and Porto-Vecchio) and in mountain areas along the road between Ajaccio and Corte (Vizzavona in particular). The Capicorsu, the eastern plain and the mountains of southern Corsica (Alta Rocca) seem less surveyed. INPN contains only few data on Diptera regardless of the sector (fig. 1C). Hemiptera (fig. 1D) have a rather irregular pattern with more data in the extreme south of Corsica. The Coleoptera data reveal a broader geographical coverage, which is, however, very incomplete given the diversity of the group, with data peaks near Corte (in particular Vizzavona) and Porto-Vecchio. Hymenoptera present a more homogeneous geographical coverage thanks to extensive surveys that have focused on Apoidea and ants.

A review of the literature and available data shows that Corsican endemic species are sometimes better documented than more widespread species. A possible explanation is a reporting bias in favour of remarkable taxa as perceived by naturalists with more continental references.

In terms of data available in public databases (table I), we also note the scarcity of records with standard DNA barcode sequences (a portion of the COI gene; Hebert *et al*., 2003) available from the main international repository for this molecular marker used for species identification (BOLD: the Barcode of Life datasystems - www.boldsystems.org; Ratnasingham & Hebert, 2007). Importantly, this gap likely hinders the proper understanding of the singularity of Corsican biodiversity, whereas an integrative approach to species delimitation combining traditional approaches and genetic data such as DNA barcodes may reveal cryptic diversity and overlooked cases of insular endemism (Rougerie *et al*., 2014).

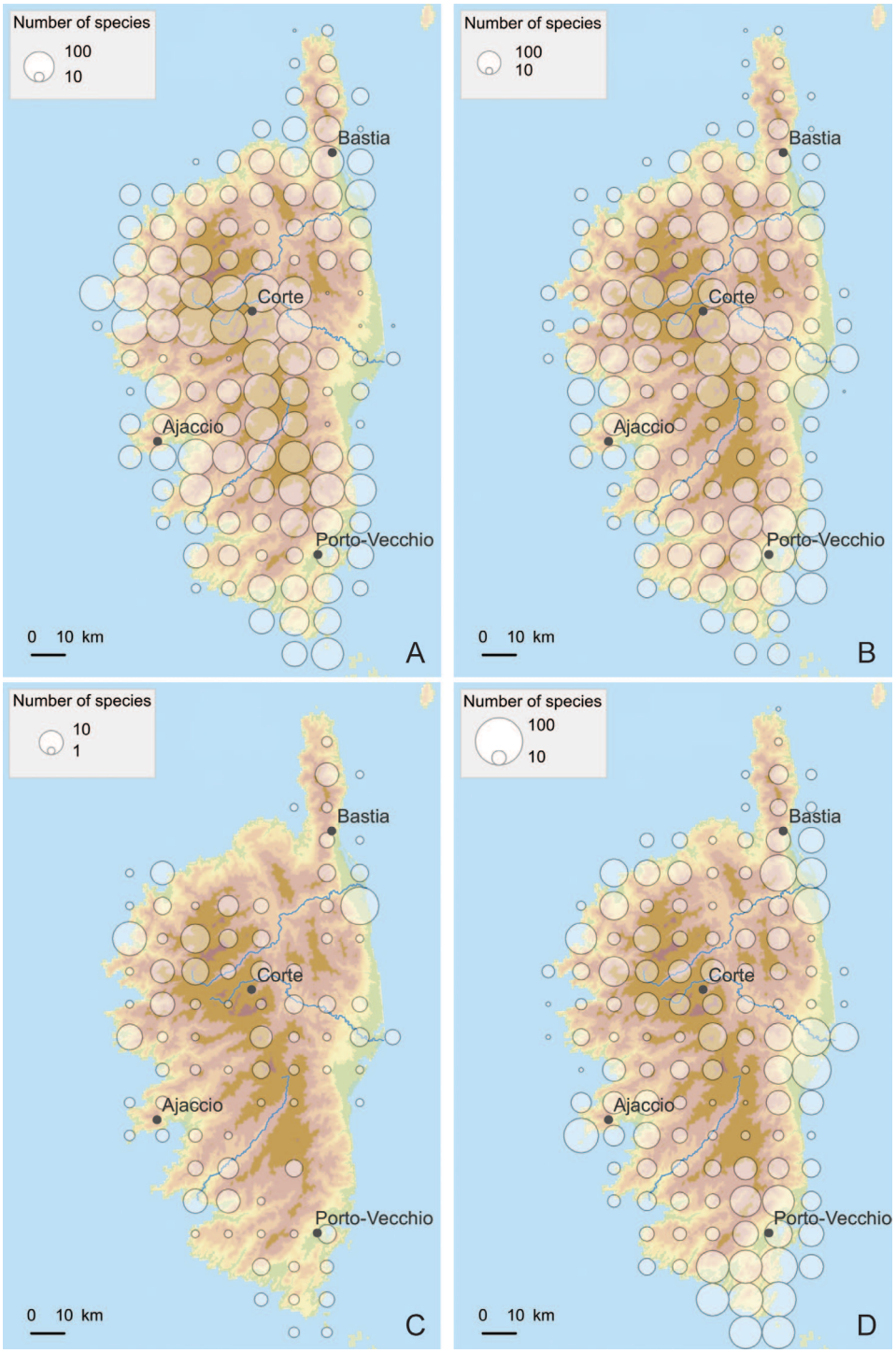

Fig. 1. – State of knowledge for terrestrial arthropods prior to the Our Planet Reviewed survey, based on data from INPN and GBIF. Knowledge is expressed as the number of species recorded per 10 × 10 km grid between 1900 and 2018: – **A**, Arachnida. – **B**, Coleoptera. – **C**, Diptera. – **D**, Hemiptera.

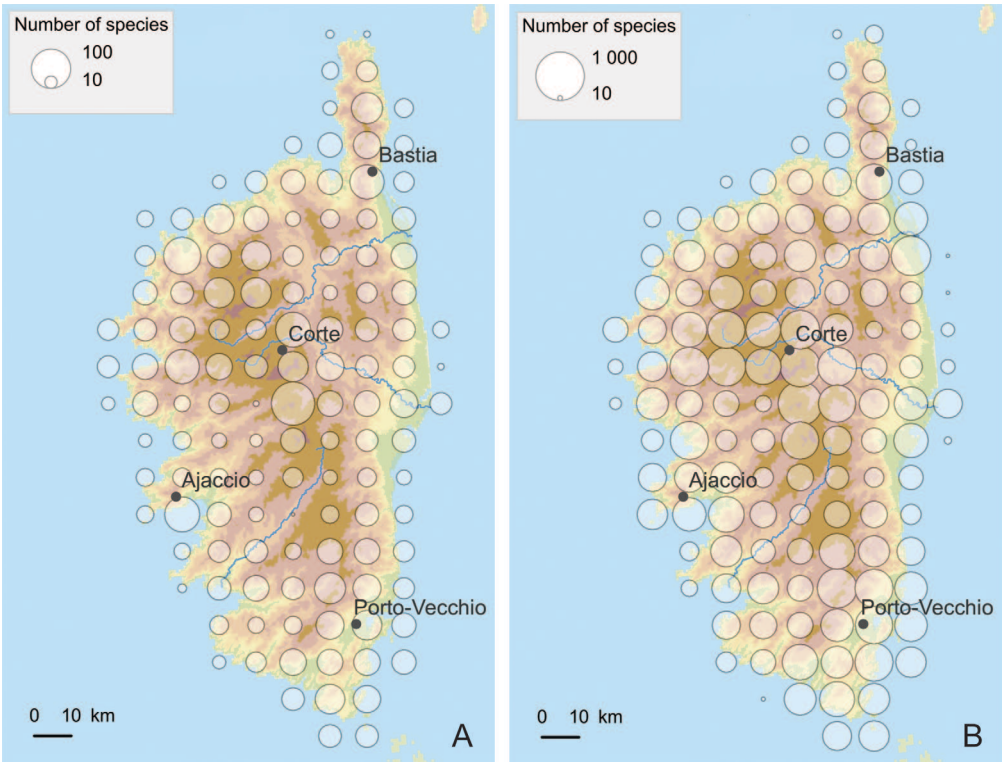

Fig. 2.– State of knowledge for terrestrial arthropods prior to the Our Planet Reviewed survey, based on the data from INPN and GBIF. Knowledge is expressed as the number of species recorded per 10 × 10 km grid between 1900 and 2018: – **A**, Hymenoptera. – **B**, All terrestrial arthropods (Insecta, Arachnida, Myriapoda and Crustacea).

Concerning observation data (including collection data), with the density of data in continental France as an arbitrary reference, the sampling effort is variable according to the taxonomic groups considered (table I). Several orders of insects have much lower data densities than on the mainland, i.e., Coleoptera, Diptera, Hemiptera, and in particular Lepidoptera with four times fewer data (per km²). Spiders have a comparable level of knowledge, while Hymenoptera and sowbugs (Isopoda, Oniscidae) have slightly more data compared to the continent. Considering that the distribution of these groups remains imperfectly known on the mainland and coverage is even lower in Corsica, this highlights the importance of increasing the observations available on Corsican arthropods in public databases.

When considering the 51,164 insect observation records from 1900 to 2018 in the INPN database (retrieved in December 2022), only 31,600 are precise, the rest being reported at the municipality level, 10 × 10 km grid or even sometimes only at the departmental level. Both for biodiversity management and research, it is necessary to have precise geolocalised data. The scientific exploration of Our Planet Reviewed in Corsica aims to fill this gap.

Sites and habitats studied

The sites were selected with the help of partners with naturalist expertise (OCIC and the Conservatoire botanique national de Corse - CBNC) and with management partners (ONF, OFB), considering both ecological and practical criteria. Sectors and study sites with different types of

forest and open wetland or coastal habitats in Corsica, with facies in a good conservation status (e.g. old-growth forests with a subnatural character, *cf*. Panaïotis *et al*., 2017) and of high botanical interest, were particularly sought after. In addition, we looked for sectors that had not already benefited from extensive entomological surveys (e.g., we did not select the Vizzavona sector, one of the most accessible and studied sites), and instead favoured those that lacked data (e.g., Capicorsu), based on spatial preliminary analyses such as those presented in figures 1-2.

Each year, six sites were studied thoroughly (table II), including one site where a massive trapping system was deployed: Campu di Bonza, Valavo and the coastline of Airbase 126. This structured, standardised or semi-standardised survey was supplemented by more occasional and opportunistic collections during trips or free surveys.

Survey strategy and protocols

Intensive insect trapping survey protocol. – In three sites an extensive trapping system focusing on interception traps was set up (table III) to collect as many taxa as possible, especially in the Coleoptera, Diptera, Hemiptera and Hymenoptera orders but also in less speciose orders like Neuroptera and Raphidioptera. The aim was to obtain the most comprehensive picture possible of the fauna and to estimate the optimal number of traps to use in a routine inventory. Different trap variants were used in order to compare the effectiveness of different trap types. In Polytrap™ traps, these variants included the colour of the trap cones, including transparent ("regular") or yellow types which were used to attract floricolous species; the colour of the funnel trap (black or green), the positioning (in undergrowth or the canopy) and the use or lack of a pheromone bouquet developed by INRAe to attract Cerambycidae (Fan *et al*., 2019) were other variants.

At the Campu di Bonza site in the Alta Rocca area (2019), 95 traps were deployed (table III). The main traps (Malaise, Polytrap™ and Funnel) operated for six weeks until the end of the survey on 25.VII.2019. The Barber and Wine traps were only activated for the first 15 days. Finally, two Malaise, two Polytrap™ and two Funnel traps remained operational until 16.VI.2020 in order to cover an annual cycle. However, it should be noted that a winter storm damaged one of the Polytrap™ devices and that Covid-19 restrictions made it impossible to service the traps between February and June 2020. At this site the Barber traps were largely destroyed by wild boar. In 2021, two sites were equipped for two weeks with one set of each type of trap (table III).

From a data management point of view, data from these 2019 and 2021 devices are available in specific datasets, including the type of traps and variants used.

Intensive Diptera pan trap protocol. – Pan traps (coloured plastic bowls filled with a fluid to kill and temporarily store trapped insects) are a widely used device to sample Diptera and Hymenoptera (see e.g., Grootaert *et al*., 2010; Pollet & Grootaert, 1987, 1994). Their use is currently being explored as a standard tool for long-term pollinator monitoring (e.g., SPRING project). Though this method holds a large number of advantages as compared to other trap types, it did not form an integral part of Our Planet Reviewed sampling protocols until the Mitaraka expedition (French Guiana) in 2014-2015 (Pollet *et al*., 2018; Touroult *et al*., 2018).

One of the important assets of pan trapping is the fact that the method is adjustable to the focal taxon, e.g., different colours attract different species and raised traps produce other yields than traps at the soil surface level. They are particularly effective to sample long-legged flies (Diptera, Dolichopodidae) (Wind & Pollet, 2017) and methodological research revealed that

Table II. – The Our Planet Reviewed investigated localities in Corsica with key features (see also map in fig. 7A).

Region	Locality name (number of figure)	Site Code	Year	Municipality	Elevational range (m)	Latitude	Longitude	Main habitats	Protection status	Site of ecological importance (ZNIEFF)
Alta Rocca	Campu di Bonza	BO	2019	Serra-di-Scopamène; Sorbollano	880-950	41.773	9.121	*Quercus ilex* forest		Yes
Alta Rocca	Samulaghia	SA	2019	Zonza	1250-1350	41.762	9.229	Old fir (*Abies*) forest		Yes
Alta Rocca	Ponte di Valpine	VA	2019	Zicavo	1250-1350	41.876	9.133	Old beech (*Fagus*) forest, heathland	N2000	Yes
Alta Rocca	Castellu d'Ornucciu (fig. 3B)	CO	2019	Serra-di-Scopamène	1550-1650	41.859	9.183	*Acer* and *Sorbus* forests, grasslands and pozzines	N2000	Yes
Tartagine	Caracutello / ravin de Silibosa	CA	2019	Mausoléo	600-800	42.505	9.006	*Juniper* and *Quercus* forest		Yes
Tartagine	Falcunari (fig. 3A)	FA	2019	Olmi-Capella	850-1000	42.487	8.975	Laricio pine forest		Yes
Agriate	Relais de Saleccia	RS	2020	Santu Petru di Tenda	250-300	42.664	9.215	Ruderal area of Agriate maquis	protected site	Yes
Agriate	Ostriconi	OS	2020	Palasca	0-20	42.653	9.077	Coastal dunes and wetlands	protected site	Yes
Agriate	Plage Saleccia (fig. 3 C-D)	PS	2020	Santu Petru di Tenda	0-20	42.722	9.210	Coastal dunes and wetlands	protected site	Yes
Agriate	Strette de Saint-Florent	ST	2020	Santu Petru di Tenda, San Gavinu di Tenda, Palasca	100-200	42.672	9.345	Maquis and garrigues on limestone	N2000, protected site	Yes
Agriate	Ripisyle de l'Aliso	PL	2020	Oletta	5-20	42.654	9.296	Grasslands, riparian vegetation and hills on limestone	N2000	No
Capicorsu	Sisco / col de San-Giovani	SI	2020	Sisco	300-950	42.813	9.439	Wooded and damp depression. Maquis ridge	N2000, protected site	Yes
Côte orientale	Littoral de la Base aérienne 126	BA	2021	Ghisonaccia	1-5	41.923	9.410	Coastal dunes and wetlands	protected site	Yes

Table II. – *(continued).*

Region	Locality name (number of figure)	Site Code	Year	Municipality	Elevational range (m)	Latitude	Longitude	Main habitats	Protection status	Site of ecological importance (ZNIEFF)
Côte orientale	Pinia (fig. 3G)	PI	2021	Ventiseri	1-10	42.022	9.468	Coastal dunes and wetlands. Pine forest	N2000	Yes
Côte orientale	Lavu Santu	LA	2021	Zonza	0-10	41.705	9.398	Coastal dunes and wetlands	N2000	No
Côte orientale	Carrataghju (fig. 3F)	CAR	2021	Portivechju	0-50	41.575	9.345	Costal wetland, maquis, Myrtus forest, rock slabs		Yes
Côte orientale	Marais salants de Portivechju	MS	2021	Portivechju	0-5	41.586	9.291	Salt marshes	N2000, protected site	Yes
Côte orientale	Suberaie de Valavo (Fig. 3H)	VAL	2021	Sotta	50-100	41.525	9.226	Cork oak forest, grasslands, maquis		Yes
Capicorsu	Capicorsu (fig 3E)	CC	2021	Ersa, Rogliano, Centuri	0-500	43.006	9.402	Beaches, maquis, rocky shores, Quercus ilex forests	N2000, protected site	Yes

traps at the soil surface level collect the highest number of species and specimens. Moreover, arboreal species were found in the largest numbers in blue traps, whereas overall numbers of most other species are highest in white traps (Pollet & Grootaert, 1987, 1994). Yellow-coloured pan traps are also well known to attract multiple Diptera and Hymenoptera taxa.

As pan traps are suitable for a wide array of flying insects and long-legged flies in particular, a protocol was designed for Diptera on the basis of this method. In each investigated area four sites are selected that represent different habitat types. As humid habitats harbour the richest dolichopodid communities, wherever possible, mainly riparian biotopes and marshlands or swamps were investigated. In each site, five trap units were employed; one trap unit consists of one blue, one white and one yellow trap which are arranged closely together (fig. 4G). The pan traps used are coloured lightweight bowls (www.party.be) with a 1 cm flat upper rim (inner diameter: 15 cm, depth: 4 cm) (Pollet *et al.*, 2018). Trap units are installed either on a virtual line at about 3 m from each other or in the most promising spots of the site (e.g., well-lit spots in an otherwise dark forest). They are filled for 2/3 with a mild formalin solution (< 5%) and a detergent to lower the surface tension. Yields of all traps of the same colour are pooled into one single sample, as such each site produces three samples. Trap yields are collected using a sieve and the total yield is transferred to a whirlpak in the field to which a 70% alcohol solution is added to store the collected insects. This protocol has been applied in the Our Planet Reviewed expedition in Corsica in June 2019 and May 2021.

Between 23 and 26.VI.2019, 16 sites at four different research locations (BO, SA, VA, CO, see table II) in the Alta Rocca area (southern Corsica) were selected. All traps were operational for four consecutive days (from June 27 to 30, 2019). Between 18 and 26.V.2021, 16 sites at four other locations (BA, CAR, LA, PI) were investigated in the same way. At three locations, traps were operational for four days and at CAR for three days.

Core protocol by active search and punctual trapping. – In order to ensure a thorough sampling and to leave traps for a short time (e.g. pan traps), each study site was visited twice at intervals of a few days by the team of scientists. Participants were free to investigate the entire site, each using appropriate techniques in the habitats suitable for their taxonomic group. Sweeping and beating vegetation, pickaxe searching and collecting by net were widely used.

We attempted to install necrophagous traps in 2019 but due to the almost systematic destruction by wild boar this technique was abandoned.

Series of pan traps (coloured plates) (fig. 4H) were set up by hymenopterists (R. Le Divelec, B. Santos) in addition to the structured Diptera scheme mentioned above.

Sample processing and data management flows

A workflow for specimen processing and data management was designed at an early stage of the project building on previous experiences (Touroult *et al*., 2021; Ichter *et al*., 2022) and on existing international standards on data quality (Chapman, 2005).

Arthropod collections were organised along two pathways depending on whether they originated from active collections made by an expert or from passive trapping (Malaise, Barber, etc.) (see above). In the former case, the samples and collected specimens were all managed by the taxonomist, allowing him/her to adopt the appropriate processing method for the specimens of his/her focal group (e.g. in ethanol in a vial, preparation on a cotton layer, dry mounting on a board or pin) as well as for its labelling. In the case of collective trapping efforts, the sorting of specimens was carried out after the field work season by entomologists with a generalist/broad expertise on insect taxonomy (Thibault Ramage and Lionel Valladares). They were responsible for separating subsets from the samples according to the expertise of the taxonomists involved in the project. Thus, the specimens were sorted by order, superfamily, family and sometimes by subfamily and stored in a separate tube per collection event. These tubes were then sent to each expert who had previously signed a study and specimen sharing agreement with the MNHN. For each order, a coordinator was assigned to ensure a smooth dissemination of material and information among experts responsible for the identification of specimens. For some orders, a considerable number of specialists were enlisted. For example, for Diptera, 43 taxonomists expressed an interest to collaborate.

Due to the large number of samples processed and collected, ensuring accurate traceability requires the use of stringent labelling procedures with a unique code to designate each collection event. The use of a standardised code by all participants was the most effective way of maintaining traceability of samples and specimens from the field to the collection including trapped specimens. A "site" represents a defined geographical area or natural region (e.g. Ostriconi, Pinia, Capicorsu, etc.). Within each site, one or more survey events (also called "stations" in the database) were carried out. Each event records one or more samples, each listing one or more specimens and/or taxa collected and/or identified. Accordingly, each survey event or "station" is defined by a unique code containing the following four variables separated by dashes:

– a 2-3 letter code to indicate the site (see table II),

– a 2-3 letter code to indicate the sampling method used (see tables III and IV),

– a 2-3 letter code to indicate the name of the collector/observer (table V),

– a serial number.

For example, the code "CAR-HC-RLD-09" was attributed to specimens collected by hand on sight (HC) by Romain Le Divelec (RLD) in station number 9 (09) of the Carrataghju

site (CAR). Alternatively, this same code describes the 9th sample collected by RLD using HC in site CAR. This naming rule makes it possible to label the collection tubes clearly and unambiguously to link the essential collection information to the specimens, to disseminate the tubes among other colleagues and to readily compile a taxonomic synthesis by site. This method also makes it possible to measure the survey efforts from a spatial and temporal point of view.

All the stations and surveys were managed using the CarNat/CardObs software suite (https://cardobs.mnhn.fr) dedicated to the recording and management of naturalist data. Experts were encouraged to enter station information directly in the field using CarNat (fig. 5G). This mobile application enabled the experts to geolocate, describe the station and the sampling techniques used, attach one or more photographs of the habitat and add records based on the list of available names in the national taxonomic reference, TAXREF (Gargominy *et al*., 2022). CarNat can operate outside the telecommunication network, which guarantees

Table III. – List and description of the trapping techniques used in the intensively sampled sites.

Name	**Code (figure)**	**Description**	**Main focal taxa**	**Campu di Bonza (five stations), each station**	**Coastline of the Airbase 126**	**Forest of Valavo (Sotta)**
Main habitat type (sampling period)				Green oak forest Alta Rocca (14. VI-25.VII.2019)	East Coast swamp forest (8-25.V.2021)	Cork oak forest of Porto-Vecchio (10-26.V.2021)
Malaise	**MT** (fig. 4C)	Interception of flying insects. Malaise tent, black with white roof, 1.5 m long.	Flying insects	2 traps	5 traps	5 traps
Polytrap™	**PT** (fig. 4A)	Transparent interceptor trap, cross-shaped, with transparent or yellow collecting cone (Brustel, 2012).	Coleoptera, Hemiptera	2 yellow + 3 transparent cones	4 yellow + 6 transparent cones	4 yellow + 6 transparent cones
Lindgren funnel trap	**LF or LFT** (fig. 4B)	Trap with nested funnels, mimicking the dark shape of a trunk.	Saproxylic beetles (Coleoptera)	2 green + 2 black traps	5 green + 5 black traps	5 green + 5 black traps
Pitfall (Barber)	**PF** (fig. 4F)	Cup buried in soil with upper margin at soil surface level, filled with water and detergent.	Soil-dwelling arthropods	4 traps	10 traps	10 traps
Aerial attractive trap (or wine trap)	**WT** (fig. 4E)	Aerial traps composed of plastic water bottles baited with red wine and sugar (Touroult & Witté, 2020).	Coleoptera Cerambycidae and Cetoniinae mainly	4 traps	10 traps	10 traps

Table IV. – List and description of the collecting techniques used in (nearly) all surveyed sites.

Name	Code	Description	Main focal taxa	2019	VI.2020	X.2020	2021
Beating sheet	**BS** (fig. 5F)	The beating tray (a white cloth stretched out on a 1 × 1 m frame) is held under a tree or shrub and the foliage is then beaten with a stick	Mainly Coleoptera, Hemiptera, Dermaptera, and Arachnida	X	X	X	X
Sweep net	**SN** (fig. 4G)	Sweeping of low vegetation or soil with a reinforced net to collect any insects that are present	Almost all insect orders, especially phytophagous species, Diptera, Hymenoptera; Arachnida	X	X	X	X
Active search, hand collection	**HC** (fig. 4I, 5A-B)	Active search on flowers, trunks, under stones, in decomposed wood (with or without net, pick,...)	All arthropods	X	X	X	X
Ground sampling point (Matocq glove)	**MGG**	Hand collection on the ground over an area of 2 m² (detection of active specimens with a Matocq glove). Approx. 10 plots per site	Hemiptera (mainly Heteroptera)	X	X	X	X
Acoustics stations	**LS**	5-minutes acoustics stations with and without the use of an ultrasonic detector. Approx. 10 listening stations per site	Hemiptera, Cicadoidea Orthoptera	X	X	X	X
Litter sieving	**SI** (fig. 5D)	Surface litter sampling and rapid sieving on a beating tray or extraction by Berlese collector	Litter arthropods, ants, Coleoptera, Heteropterans (Tingidae, Nabidae, Rhyparo-chromidae)			X (one litter sieving per site)	X (approx. five litter sieving per site)
Landing net, Aquatic D-Net	**LN** (fig. 5C)	Sampling of water body with landing net or bringing-up silt and debris in the D-net	Aquatic Hemiptera (Nepomorpha and Gerromorpha) and Coleoptera	X (opportunistic Hemiptera sampling)	X (opportunistic Hemiptera sampling)	X (opportunistic Hemiptera sampling)	X (intensive Coleoptera sampling)
Motorised Hoover	**DVAC** (fig. 5E)	Motorised hoover to suck arthropods from the ground and from within low vegetation (Herzog *et al*., 2012)	All arthropods, mainly Arachnids, Hemiptera, and Coleoptera				X (10 samples per site)
Main light trap - Mercury vapour lamp (125 or 250 W)	**UV**	Searching for insects attracted at night by UV light (using a white sheet as a reflector)	Lepidoptera and various other insect groups	X (125 W, two complete nights per site)	X (one trap, 250 W, at Relais de Saleccia)	X (one complete night per site (sept.); one trap at Relais de Saleccia)	X (125 W, two complete nights per site)

Table IV. – *(continued).*

Additional light traps (LepiLED)	**LED-UV** (fig. 4D)	Searching for insects attracted at night by low-power UV light placed at a distance from the main light trap (UV)	Lepidoptera and various other insect groups	X (two complete nights with two Lepiled per site)	X (one complete night)	X (two complete nights with two Lepiled per site)	X (two complete nights with two Lepiled per site)
Honeydew	**M**	Insect sampling on tree trunks with a substance composed of fruit, honey, and alcohol. Two nights per site with one honeydew	Lepidoptera, Erebidae	X		X	X
Attractive aerial trap	**WT** (Fig. 4E)	Plastic bottle containing sweetened red wine (Touroult & Witté, 2020)	Coleoptera, mainly Cerambycidae and Cetoniinae		X (five traps per site)		
Necrophagous trap	**PFN**	Barber trap (cup sunk into the ground) with bait suspended over it (usually seafood)	Necrophagous beetles (Histeridae, Scarabaeinae, Silphidae)	X (two traps per site for four days)	X (one trap at relais de Saleccia for ten days)		
Yellow, white, blue and red pan traps	**YPT, WPT, BPT, RPT** (fig. 4H)	Coloured plastic bowls (yellow, white, blue or red) installed at the soil surface level and filled with a fixative fluid and detergent	Mainly Hymenoptera and Diptera, but also some Coleoptera, and other insect orders	X	X		X
Attractive syrup	**AS**	Spray the foliage of shrubs and low branches of trees with an attractive liquid (maraschino/ honey/water)	Aculeate Hymenoptera	X	X		X
Malaise trap*	**MT**	Black with white roof Malaise trap, 1.5 m long. Interception of flying insects,	All flying insects		four traps (Aliso valley) for eight days	four traps (Ostriconi), ten days	four traps (Ventiseri), ten days

* These Malaise traps were set up by experts in an opportunistic way, not as part of the structured sampling (see table III).

continuity in inventory operations. Upon return from the field, data can be transferred from a mobile device to the CardObs database using a reliable internet connection. Taking notes in the field with Carnat saves time and avoids problems with geographical coordinates or misspelt taxon names.

All participants could access their stations and records using their CarObs account. By establishing a shared dataset for each expedition, each taxonomist could also consult the stations (survey events) and records of other experts and of the passive trapping campaign. This avoids unnecessary duplication of stations (survey events) when someone transfers specimens to another colleague, or when the sorting of samples is completed. Each expert enters his/her identification results after selecting the appropriate station code, regardless of the creator of the station.

Table V. – List of scientists who participated to the fieldwork.

Name	Code	Affiliation	Studied group / function	2019	2020	2021
Jérôme BARBUT	JB	MNHN	Lepidoptera	x	x	x
Benoit CAILLERET	BC	Independent	Coleoptera		x	x
Alain CANARD	AC	Rennes University	Araneae	x	x	x
Marie CANUT	MC	Independent	Diptera, Syrphidae		x	x
Alexandre CORNUEL-WILLERMOZ	ACW	OEC- OCIC	Insect pollinators	x	x	x
Anja DE BRAEKELEER	ADB	Independent	Diptera	x		x
Thibaud DECAËNS	-	CNRS - CEFE	Oligochaeta			x
Sylvain DÉJEAN	SD	CEN Midi-Pyrénées	Aranea			x
François DUSOULIER	FD	MNHN	Hemiptera ; Orthopteroidea / Scientific coordination	x	x	x
Daniel FERNÁNDEZ MARCHÁN	-	CEFE	Oligochaeta			x
Olivier GARGOMINY	OG	OFB - PatriNat	Terrestrial Mollusca	x	x	x
Camille GAZAY	CG	OFB - PatriNat	Invertebrates / Barcoding		x	
Jean ICHTER	JI	Independent	Odonata ; Orthoptera ; Lepidoptera (butterflies) / Technical coordination		x	x
Claire JACQUET	CJ	Independent	Aranea			x
Adrien JAILLOUX	AJ	OFB - DRAS	Lepidoptera / Technical support			x
Arzhvaël JEUSSET	ArJ	OFB -PatriNat	Hymenoptera / Technical support			x
Thomas LEBARD	TL	Independent	Syrphidae		x	x
Romain LE DIVELEC	RLD	Independent	Hymenoptera	x	x	x
Antoine LÉVÊQUE	AL	OFB - PatriNat	Lepidoptera	x	x	x
Juliette MARTIN	JM	Independent	Technical support		x	x
Armand MATOCQ	AM	MNHN	Hemiptera			x
Thierry NOBLECOURT	TN	Independent	Hymenoptera, Symphyta			x
Franck NOËL	FN	Independent	Isopoda ; Diplopoda ; Hirudinea		x	
Olivier PASCAL	-	MNHN	Technical coordination	x		
Julien PIOLAIN	JP	MNHN - Isyeb	Lepidoptera / Technical support		x	
Eddy POIRIER	EP	Independent	Insects / Sampling	x	x	x
Rémy PONCET	RP	OFB - PatriNat	Lichenes	x	x	x
Philippe PONEL	PP	CNRS - IMBE	Coleoptera			x
Marc POLLET	MP	Independent	Diptera	x		x
Quentin ROME	QR	OFB - PatriNat	Hymenoptera		x	x
Rodolphe ROUGERIE	-	MNHN - Isyeb	Lepidoptera / Barcoding	x		x
Solène ROBERT	SR	OFB - PatriNat	Technical support			x
Bernardo SANTOS	BFS	MNHN - Isyeb	Hymenoptera, Ichneumonidae			x
Fabien SOLDATI	FS	ONF	Coleoptera	x		x
Jean-Claude STREITO	JCS	INRAE	Hemiptera			x
Nicolas SUBERBIELLE	NS	CBNC	Fungi		x	x
Julien TOUROULT	JT	OFB - PatriNat	Coleoptera / Scientific coordination	x	x	x
Claire VILLEMANT	CV	MNHN - Isyeb	Hymenoptera	x	x	x
Benjamin ZELVELDER	BZ	MNHN - Isyeb	Lepidoptera/Technical support			x

Fig. 3. – Selection of ecosystem types and sites studied during the Our Planet Reviewed Corsica expeditions. – **A**, Laricio pine forest, Tartagine. – **B**, Pozzines, Coscione plateau. – **C**, Maquis, Agriate. – **D**, Padullela marshes, Agriate. – **E**, Low maquis, northern Capicorsu. – **F**, Littoral pond and marshland, Carrataghju. – **G**, Saltmarshes, Pinia. – **H**, Cork oak forest, Valavo. *(Photos A-B by J. Touroult, C-H by J. Ichter).*

Fig. 4. – Collecting techniques. – **A**, Polytrap™ with yellow cone. – **B**, Green Lindgren funnel. – **C**, Malaise trap. – **D**, Light trap with LEPILED. – **E**, Aerial attractive trap (or Wine trap). – **F**, Pitfall or Barber trap. – **G**, Pan trap unit for Diptera (see Intensive Diptera pan trap protocol) and targeted net sweeping. – **H,** Four coloured pan traps (other protocols). – **I**, Active search on sight by bark removal of dead trees. *(All photos by J. Touroult).*

Fig. 5. – Sampling techniques and sample processing. – **A**, Active search in a dead tree trunk. – **B**, Diptera collection with an entomological net. – **C**, Aquatic insects sampling with a landing net. – **D**, Litter screening after passing through a sieve. – **E**, Arthropod sampling with vacuum suction device in a wetland, – **F**, Vegetation beating. – **G**, Entering the geographical position of a pitfall (or Barber) trap station with the Carnat mobile tool. – **H**, Field laboratory in Agriate. *(Photos A-F, H by J. Ichter, G by J. Touroult).*

Upon return from the field and once part or all of the material has been identified, the data entered into CardObs can be shared within the framework of the National Inventory of Natural Heritage (INPN) and its information system (SINP). The data are then shared at their maximal geographical precision and are visible and findable notably on OpenObs (https://openobs.mnhn.fr) and on the GBIF website (https://www.gbif.org). The first data were already published three months after the end of the expedition. In case of a change of identification, updates are reflected in these systems in a seamless workflow.

Data publication from CardObs to the national biodiversity inventory (INPN) is operated by PatriNat through the SINP information system. This system guarantees a series of controls including compliance with SINP standard formats (e.g. required formats, geographical and taxonomic repositories) and consistency (i.e. logical compatibility within the data).

All datasets are consolidated in a common acquisition framework (*cadre d'acquisition*) https://inpn.mnhn.fr/espece/cadre/14975.

– La Planète Revisitée Corse : observations lors des phases de reconnaissance et d'installation: https://inpn.mnhn.fr/espece/jeudonnees/27515 /GBIF https://doi.org/10.15468/2ecziz

– La Planète Revisitée Corse 2019 : protocole de piégeage entomologique - Alta Rocca: https://inpn.mnhn.fr/espece/jeudonnees/21812 / GBIF https://doi.org/10.15468/apsjis

– La Planète Revisitée Corse 2019 : prospections Alta Rocca et Tartagine: https://inpn.mnhn.fr/espece/jeudonnees/21813 / GBIF https://doi.org/10.15468/hyemit

– La Planète Revisitée Corse 2019 : protocole assiettes colorées - Alta Rocca: https://inpn.mnhn.fr/espece/jeudonnees/33256 / GBIF https://doi.org/10.15468/ha9tdf

– La Planète Revisitée Corse 2020 : prospections Agriate, Saint-Florent et Cap Corse: https://inpn.mnhn.fr/espece/jeudonnees/38455 + GBIF https://doi.org/10.15468/bwhm6a

– La Planète Revisitée Corse 2021 : protocole assiettes colorées - Côte orientale: https://inpn.mnhn.fr/espece/jeudonnees/55237 / GBIF https://doi.org/10.15468/5mujbk

– La Planète Revisitée Corse 2021 : prospections Côte orientale et Cap Corse: https://inpn.mnhn.fr/espece/jeudonnees/55164 / https://doi.org/10.15468/g5astt

– La Planète Revisitée Corse 2021 : piégeage entomologique - Côte orientale: https://inpn.mnhn.fr/espece/jeudonnees/55165 / GBIF https://doi.org/10.15468/uvqn6u

– La Planète Revisitée Corse : échantillonnage des vers de terre: https://inpn.mnhn.fr/espece/jeudonnees/54538 / GBIF : https://doi.org/10.15468/gjgtz6

At the end of each field work day, the experts were invited to select a few specimens of each (morpho-)species to detach a tissue sample (leg or piece of leg) for DNA barcoding. These specimens were also photographed and given a unique number (SampleID code) to ensure traceability of the specimen, its sequence and the collection metadata (fig. 5H). Sequencing was performed at the University of Guelph (Ontario, Canada) and specimen and sequence data are stored and managed within the Barcode of Life Data System (BOLD) (www.boldsystems.org). A link with CardObs is ensured to allow for the transfer of collection data to BOLD and facilitate future updates of taxonomic information when relevant. All the sequences produced require a curation process to clear contaminants and correct or complete identifications; this process benefits from the continued input from expert taxonomists involved in the programme. Once achieved, these sequences will be made publicly available through a dedicated data-release paper (Rougerie *et al*., in prep.). Sequenced specimens are all stored as vouchers and are linked with molecular reference libraries through their SampleID code, physically printed and attached (e.g. pinned) to the specimen. Once identified, all the specimens processed through DNA barcoding are destined to be deposited in the MNHN collections. This is already the case for Coleoptera and Heteroptera, which were dry-mounted during the summer of 2022.

Fig. 6. – Processing flow for samples containing Diptera. **– A**, Pan trap unit four days after installation on bank of small stream in pozzine of Castellu d'Ornucciu, Serra-di-Scopamène (2019). – **B**, Diptera coordinator collecting Dolichopodidae (Diptera) on sight with sweep net at pan trap sampling site in dry oak forest of Campu di Bonza, Serra-di-Scopamène (2019). – **C**, Total yield of Diptera samples from pan traps and sweep netting, Alta Rocca (2019). – **D**, Collection of subsamples as the result of separating specimens of different families in separate vials. – **E**, Selection of pooled subsample sets per Diptera family. – **F**, Overview of pooled subsample sets. – **G**, Packed subsample sets ready to be disseminated to Diptera taxonomic experts.

This general procedure can be illustrated with the treatment of Diptera, which required a lot of post-processing. Diptera were sorted from 871 samples that were collected by multiple participants in the expedition. Specimens of different families were subsequently separated during this process, producing about 4,300 subsamples. Diptera subsamples without an expert were deposited at the MNHN, while the remaining over 3,100 subsamples of 37 different Diptera families were finally disseminated among the involved Diptera experts (fig. 6). Prior to the expedition the Diptera coordinator (MP) contacted a large number of mainly European Diptera experts, 43 of whom committed to contribute to the identification process. Next to the general coordinatorship, three roles were defined: (i) coordinator, (ii) lead and (iii) collaborator. A lead takes the responsibility for the identification of the specimens, if desired, supported by one or more collaborators. The role of coordinator entails the sorting of suprafamily samples (e.g., miscellaneous Diptera Brachycera; Empidoidea) into fractions that are studied by different leads and is mostly combined with the latter role. Ultimately about 30 experts from 13 different countries (Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Italy, Netherlands, Poland, Sweden, United Kingdom, USA) were actively involved, two of which left the project along the way. Each expert signed the agreement form mentioned earlier that defines the conditions and rules for the return of data and the return/retainment of specimens.

Collecting permits and access authorisations

When selecting the sampling sites, we approached the site owners and managers (Conservatoire du Littoral - CdL, Office national des forêts or local authorities) to inform them and obtain their approval. The sampling did not target the few species of arthropods protected in Corsica but given the risk of their unintentional collection by trapping, we applied to the Corsican DREAL for authorisation to collect protected species as a preventive measure. We thus benefited from prefectural decisions for the two Corsican departments during all the surveys (ref: arrêté 2A-2019-05-21-002, 2A-2021-06-02-00004 and 2B-2021-06-02-00008).

For tissue sampling for DNA sequencing we made the necessary declarations to the French Ministry of Ecology. However, it turned out that this step was not necessary as simple sequencing for taxonomic purposes is not considered to be a use of genetic material according to the French Ministry of Environment transposition of the Access and Benefit Sharing of Genetic Resources (ABS).

Participants

More than 40 people actively participated to the terrestrial part of the programme including 34 field biologists. A coordination team (FD, JI, OP, JT) was in charge of the scientific and technical organisation including exploratory visits of the sites and meetings with local partners, fieldwork planning, logistics and post-production. RR coordinated DNA barcoding efforts. Alice Leblond (MNHN) was responsible for project administration.

In the preparatory phase, colleagues from various organisations (e.g., CdL, OEC, OFB, ONF, CBNC) helped with the selection of the sites. In 2021, the Airbase 126 provided three persons from its staff to provide support with logistics and communication. Two film producers (Paul Winling and Sébastien Pagani) and two journalists (Julien Faure and Yann Chavance) joined the team *in situ* on several occasions. After the fieldwork, two professional entomologists (Thibault Ramage and Lionel Valladares) were hired for a few months to sort the material from the entomological traps.

Public outreach

The Our Planet Reviewed programme also aims to raise awareness among the general public about neglected biodiversity and the many discoveries that remain to be made in Corsica. Within the framework of this programme, several papers have been published in the local and regional press, as well as several news flashes on television.

From a perspective of national broadcasting, the following documentaries were directly related to the follow-up of the work of the taxonomic experts throughout the Corsican expedition:

– *La Planète revisitée : Corse (volet terrestre)* YouTube video (https://www.youtube.com/watch?v=WbnmQ5HpVLc) by MNHN (Sébastien Pagani 2019);

– *Biodiversité : la Corse revisitée*, France Télévision TV programme (Lionel Boisseau, 2020);

– *La Planète Revisitée : Corse*. Un travail collectif / En immersion / Sur le terrain / Un inventaire moderne / Bilan à chaud. YouTube videos (https://www.youtube.com/watch?v=bQvdB3z1sqQ&t=141s) by MNHN (Paul Wiling, Jean Ichter and Alice Leblond, 2021);

– *Sur les traces de "La planète revisitée" en Corse.* YouTube video (https://www.youtube.com/watch?v=YvZNuScHhgQ&t=15s) by Office français de la biodiversité (Rémi Knaff and Guilhem Richard, 2021);

– *En Terre ferme : Les punaises de Corse*, Ushuaïa TV programme, 2021;

– *Association de bienfaiteurs : Le Maquis*, Arte TV programme, 2022.

Table VI. – Arthropod data produced within the framework of the *Our Planet Reviewed in Corsica* expedition (date: 15.I.2023), as compared to previous knowledge available in public databases (INPN and BOLD).

Taxon	Number of occurrence data in Corsica (< 2019)	Occurrence data produced (2019-2021)	Number of species with at least one data record in Corsica (< 2019)	Number of species observed (2019-2021)	Number of sequenced specimens from Corsica available in BOLD (< 2019)	Number of specimens sequenced (2019-2021)
Arachnida	7,134	3,560	654	499	95	305
Insecta, Coleoptera	11,226	10,707	1,276	1300	75	2,820
Insecta, Diptera	1,675	755*	179	140	18	633
Insecta, Hemiptera	1,567	4,836	345	550	39	926
Insecta, Hymenoptera	6,951	2,899	517	370	117	1,493
Insecta, Lepidoptera	14,472	4,884	989	570	317	2,290
Insecta (all orders combined)	51,164	27,145	3,777	3,100	569	8,446
Malacostraca, Isopoda, Oniscidea	1,324	370	77	45	0	119

* Most of these Diptera data relate to a few families only (mainly Syrphidae and Stratiomyidae), while the identification and collection of identification results is still ongoing (see text).

Public outreach also involved children from local schools who had the opportunity to meet with taxonomists in the field in 2020 and 2021. Several activities for the general public were also organised during the fieldwork periods.

Preliminary results, discussion and conclusion

The cumulative survey effort of all the scientific and technical participants represented approximately 880 days of fieldwork, with a total of 28 experts involved *in situ*, 26 of whom were dedicated to invertebrates, two to lichens and fungi and seven individuals providing technical and logistic support. The field campaigns enabled a thorough investigation of 19 sites (fig. 7A) with a variety of habitats including a few sectors that had hardly been studied before. They also produced a large amount of precisely georeferenced data on terrestrial arthropods of Corsica. By early 2023, 85 experts (incl. 34 Diptera workers) have contributed to the identification of the collected specimens. As of 15.I.2023, the datasets produced include 4,800 collection events (unique combination of place, date, technique, observer, *cf.* fig. 7A), 38,000 occurrence data of 4,900 taxa. For terrestrial arthropods alone, there are 31,100 occurrence data and 3,900 taxa (table VI and fig. 7B). The increase in occurrence data is significant at the scale of Corsica since these data represent, depending on the group, an increase ranging from 28% (woodlice) to 308% (Hemiptera) compared to the amount of public data available before 2019 and an increase of 53% for insects as a whole (table VI). The order Diptera has not yet been included in these preliminary results.

With respect to DNA barcoding results, 8,879 arthropod specimens were sampled (table VI) of which 6,857 yielded a DNA barcode sequence. This effort considerably increased the number of DNA barcodes in BOLD for the fauna of Corsica, with a 14-fold increase in existing sequences of insects of Corsica compared to what was available before the start of the survey (table VI). Data curation is currently in progress and DNA sequences and specimen data and images will be made publicly available soon.

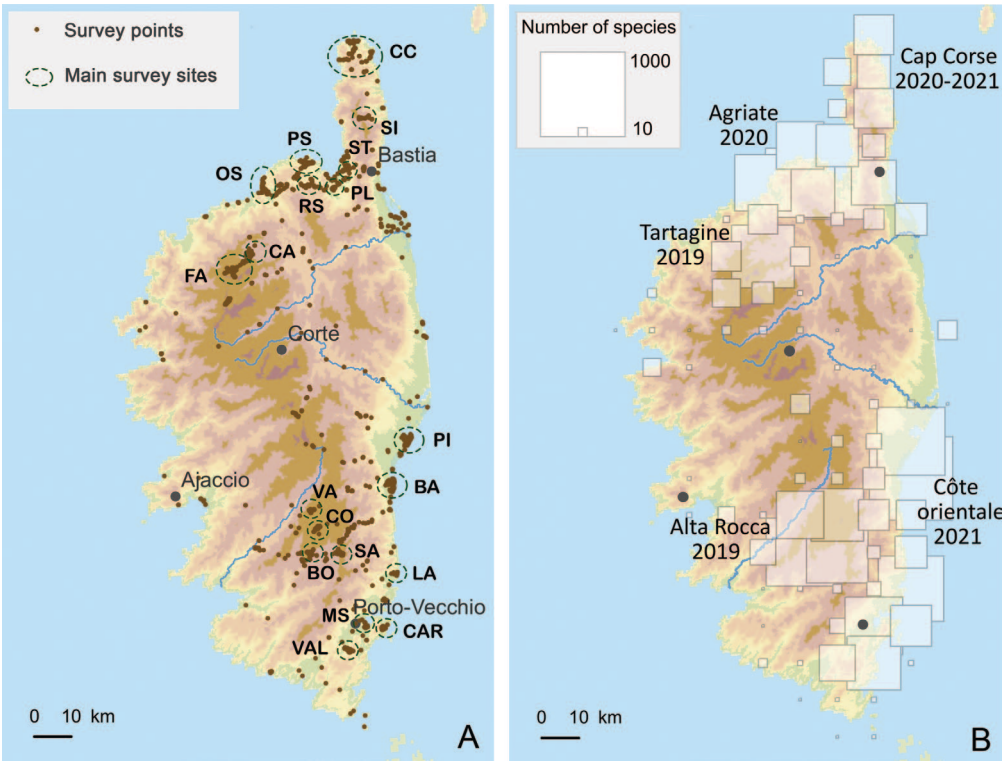

Fig. 7. – Our Planet Reviewed 2019-2021 sampling intensity for terrestrial arthropods (Insecta, Arachnida, Myriapoda and Crustaceae). – **A**, Main collecting sites and precise sampling localities, including opportunistic records and recognition missions. – **B**, Species richness obtained and major sampling areas, squares of proportional size on a 10 × 10 km grid.

Twelve species new to science have already been described, in part or whole, on the basis of the material collected in the framework of Our Planet Reviewed: one new Chilopoda (Iorio, 2021), eight new Diptera (Boardman & Starý, 2020; Push *et al*., 2020; Ivković *et al*., 2021; Pollet *et al*., 2022; Grootaert *et al*., 2023), two Hymenoptera Apoidea (Le Divelec, 2023) and even one new hawkmoth Lepidoptera (Haxaire *et al*., 2023).

Furthermore, 148 first faunal records for Corsica were also published: 33 Arachnida (Déjean *et al.*, 2023), 19 Coleoptera (Touroult *et al.*, 2023), 70 Diptera (Grootaert *et al.*, 2023; Haenni *et al.*, 2023; Ivković *et al.*, 2021; Kolcsár *et al.*, 2021; Mengual *et al.*, 2023; Mortelmans & Pollet, 2023; Quindroit *et al.*, 2023; Tillier, 2023b; Zeegers & Pollet, 2023), 16 Hymenoptera (Le Divelec, 2023; Noblecourt, 2023; Villemant *et al.*, 2023), 5 Lepidoptera (Barbut & Lévêque, 2020; Barbut *et al.*, 2021; Jailloux, 2023), 5 Neuroptera (Tillier, 2023a) as well as the sighting of a ground beetle (Coleoptera, Carabidae) that had not been seen for decades (Soldati & Touroult, 2021).

In addition to the contribution to knowledge on invertebrates of Corsica, the collected and sequenced material has contributed to various taxonomic revisions: Hymenoptera Apoidea (Le Divelec, 2022; Litman *et al*., 2022; Wood & Le Divelec, 2022), Geometridae of the genus *Thera* (Lepidoptera) (Tautel, 2021), the *Phragmatiphila nexa* complex (Lepidoptera) (Govi *et al*., 2022) and faunistics of the Tenebrionidae of the genus *Phaleria* from France (Coleoptera) (Soldati & Soldati, 2022). Next to arthropods, the programme resulted in remarkable findings on the Corsican fauna of earthworms (Marchán *et al*., 2022; Marchán *et al*., 2023).

The data produced and disseminated with all their precision in the SINP will make it possible to contribute to the distribution atlases currently being prepared such as the Corsican atlas for Orthoptera and that for moths. In addition, these data will enable us to complete and update the list of trigger species in the key biodiversity zones listed as ZNIEFF (Lepareur *et al*., 2022).

Stepping back to the scale of large Mediterranean islands, our programme is comparable to the survey carried out by our Italian colleagues in Sardinia from 2003 to 2008, which resulted in a large series of scientific articles on its fauna (e.g. Cerretti *et al*., 2009; Nardi *et al*., 2011). However, contrary to the latter survey, our approach involved the massive use of traps in only a few sites, the management of precise georeferenced data with their dissemination in the public biodiversity information systems and efforts to generate DNA barcode sequences for a maximum number of species.

Sampling focused on forest species, as well as on interception traps and coloured pan traps for Diptera and Hymenoptera. We did not target the fauna of caves and cavities (endogeous and cavernicolous Coleoptera), nor that of waterbody surfaces (Ephemeroptera, Plecoptera, Trichoptera) and sub-riverine habitats (stygobian fauna). Sampling of myriapods was scarce and opportunistic only due to the absence of a myriapod expert within the team. Likewise, neither mites, pseudoscorpions, springtails, silverfishes, parasitic insects (Phthiraptera, Siphonaptera), Psocoptera nor Thysanoptera were targeted in our inventories. Nevertheless, specimens of these taxonomic groups, including Neuroptera, that were occasionally collected as side catches, were stored separately and some have already been studied (Neuroptera, for example, see Tillier, 2023a).

During a previous Our Planet Reviewed exploration, we noted that the main scientific findings were published within two to five years after the mission (Touroult *et al*., 2021) and the literature indicates that, on average, it takes around twenty years for a species to be described (Fontaine *et al*., 2012). The first results of the Our Planet Reviewed Corsica expedition are promising, with the release of a large number of data and several publications. Two years after the end of the sampling phases, the exploitation of the data has only just begun and the present issue of the *Bulletin de la Société entomologique de France* will allow the dissemination of a new substantial series of results.

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